

COMPRESSOR WIRING

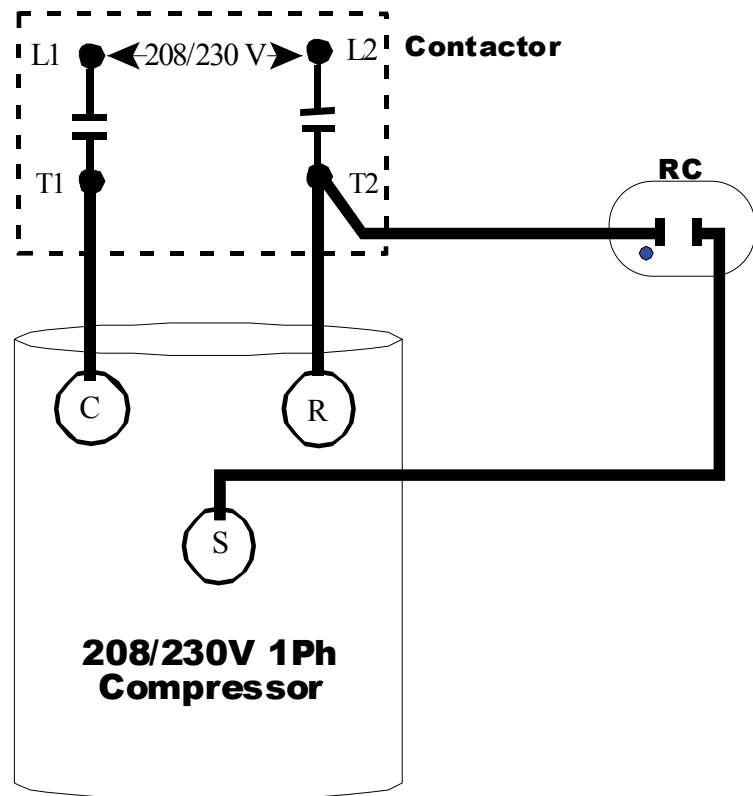
Single Phase Compressors

Our discussion will be limited to 208/230 volt, single phase compressors (208/230V 1-Ph) which are the ones found on residential and many light commercial job sites and will include only a run capacitor (RC).

On some compressors you may find a “hard start kit” also, which is made up of a start capacitor and start relay, or a start thermistor. Both devices aid in the starting of the compressor. We will focus on compressors which do not use these start devices since they are the ones you will most likely find in the field.

The terminals to be connected to the system are labeled “C” (common), “R” (run), and “S” (start). C and R need to be connected directly to the two hot lines of the 208 or 230 volt power supply—usually T1 and T2 on the contactor. The L terminals on the contactor are called the “line side” and the T terminals are known as the “load side”.

Which ever terminal you power R with should also be the terminal that powers your run capacitor. If T1 goes to R, then T1 should power your run capacitor (RC). If on the other hand you elect to power the R terminal with T2, then you should power the run capacitor with T2. Powering the R terminal on the compressor, and the run capacitor with different contactor terminals may result in



quick or immediate compressor winding damage when power is applied.

This leaves only the S (start) terminal on the compressor. It connects to the other side of the run capacitor. See the figure for the diagram of what we have just described.

Note: if one of the terminals on RC is marked as being different than the other, i.e. the blue dot on the figure, then power should be connected to this terminal from the contactor. If neither RC terminal is marked as being different than the

other it makes no difference which RC terminal is connected to the contactor.

Modern capacitors do not have a marking on either terminal. Older capacitors may have a blue dot, red dot, white dot, or some other marking that indicates that one terminal is the “power input” side of the capacitor. This marking indicates which of the two capacitor terminals is connected to the outer plate inside the RC.

Since this terminal is most likely to be the one that shorts to ground in the event that the RC fails, this fault will blow the main fuse or trip the unit’s breaker. If connected incorrectly, a capacitor which shorts to ground will pass a high current through the start winding and burn out the winding before blowing a fuse or tripping a breaker.

Capacitors without a marking on one terminal are fused internally. Regardless how the RC is powered, if it shorts to ground the internal fuse should blow and save the compressor.

NEXT MONTH

Superheat and subcooling will be defined and discussed. Just in time for air conditioning season.

NOTE FROM BUTCH

What do you guys think about a new class at Behler-Young teaching a technician how to use a meter to do troubleshooting? We would cover the use of the **volt meter, ammeter, and ohmmeter** as they relate to troubleshooting HVAC/R systems.

I would appreciate hearing what you think of this idea. My email address is:

info@777educate.com

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